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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/589,971	07/02/2007	Graham Eastham	31229-233960	2321
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VENABLE LLP P.O. BOX 34385 WASHINGTON, DC 20043-9998				
EXAMINER				
ZUCKER, PAUL A				
ART UNIT		PAPER NUMBER		
1621				
MAIL DATE		DELIVERY MODE		
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

# Office Action Summary

**Application No.**

10/589,971

**Applicant(s)**

EASTHAM ET AL.

**Examiner**

Paul A. Zucker

**Art Unit**

1621

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-32 and 34-36 is/are pending in the application.
- 4a) Of the above claim(s) 13-25, 29, 35 and 37 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12, 26-28, 34 and 36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date See Continuation Sheet
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_

Continuation of Attachment(s) 3. Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date : 1/22/10, 8/27/09, 3/12/09, 2/2/09, 8/18/06.

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election with traverse of Group I, claims 1-22, 34 and 36 in the reply filed on 27 May 2010 is acknowledged. Applicants' election of 1, 2-bis-(di-tert-butylphosphinomethyl) benzene as ligand and ethylene as substrate. Applicants have indicated that claims 1-12, 16-22, 34 and 36 are readable on the elected species. The Examiner disagrees since the adamantyl group does not read on the elected ligand. Claims 1-12, 34 and 36 are readable on the elected species. The traversal is on the ground(s) that since the combination of group III requires the particulars of Group I, restriction between them cannot be made. Upon reconsideration, the Examiner agrees with Applicants and has rejoined Groups I and III, claims 1-22, 26-28, 34 and 36, with claims 1-12, 26-28, 34 and 36 are readable on the elected species. Applicant has not provided argument for rejoinder of Group II. The requirement is therefore made FINAL between rejoined Groups I and III and Group II. Claims 13-25, 29, 35 and 37 are held withdrawn from consideration as being drawn to non-elected subject matter.

### ***Specification***

2. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

3. The disclosure is objected to because of the following informalities: A section setting forth a section headed Brief Description of the Several Views of the Drawing(s) is required. See MPEP § 608.01(f). A reference to and brief description of the drawing(s) as set forth in 37 CFR 1.74. Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 2, 10, 26-28, 34 and 36 are rejected under 35 U.S.C. 102(b) as being anticipated by Drent (EP 0577205-A2 06-1993). Drent discloses (Page 4, lines 35-46) the formation of a carbonylation reaction medium comprising a catalytic complex comprising palladium acetate (0.5 mmol), the bidentate phosphine 1, 4-di(diphenylphosphino) butane (3 mmol), and an acid, 2, 4, 6-trimethylbenzoic acid (10 mmol), meeting the limitations of the instantly rejected claims. The reaction medium comprises the reactants carbon monoxide and 1, 3-butadiene as well. Drent therefore anticipates claims 1, 2, 10, 26-28, 34 and 36.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35

U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-12, 26-28, 34 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al (US 6,348,621-B1 02-2002) when considered with Pearson et al (WO 98/41495-A1 10-1998).

Instantly claimed is a catalyst system comprising a Group VIB or VIIB metal, a bidentate phosphine ligand and an acid in which the ration of ligand to metal is at least 2:1 and the ratio of acid to ligand is at least 2:1.

Wang teaches (Column 4, lines 35-59) a catalyst system comprising palladium and the bis(di-t-butylphosino) -o-xylene ligand which corresponds to the elected specie

of ligand in a 3:1 molar ratio and its use in the carbonylation of ethylene in a reaction medium in the presence of methanesulfonic acid. Wang teaches (Column 3, lines 35-59) the ratio of ligand to palladium can vary within wide limits and suggests, as a non-limiting value, a ratio of 50:1. The Examiner takes the position that Wang's teaching of an unlimited ratio encompasses the instantly claimed ligand-metal ratios.

The difference between the catalyst system of Wang and that instantly claimed is that Wang teaches (Column 4, lines 35-59) the use of an approximately equivalent molar amount of ligand and acid at a ratio of at least 2:1 is instantly claimed.

Pearson, however, teaches (Page 7, lines 10-25, including Table 1) carbonylation using palladium and the instantly elected ligand. Pearson teaches (Page 7, line 25, Table 1, entries 3 and 4) that addition of a 10-fold molar excess acid to metal (molar amount  $\text{MeSO}_3\text{OH} = 1.37 \times 10^{-3} = (0.1 \text{ ml} \times (1.319 \text{ gm/ml})) / 96.01 \text{ gm/mol}$ ) results in an increase in product yield.

One of ordinary skill in the art would therefore have been motivated to optimize the process of Wang by the addition of excess acid to produce the instantly claimed catalyst system and reaction medium with a reasonable expectation of success.

Thus the instantly claimed catalyst system and reaction medium comprising it would have been obvious to one of ordinary skill in the art.

### ***Conclusion***

6. Claims 1-29 and 34-36 are pending. Claims 1-12, 26-28, 34 and 36 are rejected.

Claims 13-25, 29, 35 and 37 are held withdrawn from consideration as being drawn to non-elected subject matter.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul A. Zucker whose telephone number is 571-272-0650. The examiner can normally be reached on Monday-Friday 5:30-3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Daniel Sullivan can be reached on 571-272-0779. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free)? If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Paul A. Zucker/



Art Unit: 1621

Primary Examiner, Art Unit 1621